

3.0 Affected Environment, Environmental Consequences, and Mitigation Measures

3.1 Introduction

This chapter addresses existing environmental conditions and the project's potential impacts on environmental resources, examining each resource in a separate subsection. The FRA is preparing an EIS for the Fresno to Bakersfield Section of the HST Project under NEPA and the Authority is preparing an EIR under CEQA. The CEQA Guidelines encourage the preparation of joint NEPA-CEQA documents and the use of an EIS to satisfy CEQA requirements, where possible and appropriate. The FRA and the Authority have used their best judgment in preparing this combined EIR/EIS to satisfy both NEPA and CEQA requirements.

NEPA requires the consideration of potential environmental impacts in the evaluation of any proposed federal agency action. NEPA also obligates federal agencies to consider the environmental consequences and costs in their projects and programs as part of the planning process. General NEPA procedures are set forth in the Council on Environmental Quality's regulations (40 CFR 1500-1508). FRA implements NEPA through its *Procedures for Considering Environmental Impacts* (64 Fed. Reg. 101, 28545).

CEQA (Public Resources Code Section 21000 et seq.) and CEQA Guidelines (14 CCR Section 15000 et seq.) require state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, when feasible. Public Resources Code Section 21100(b)(3) provides that an EIR shall include a statement setting forth the mitigation measures proposed to minimize the significant effects on the environment.

The requirements of NEPA and CEQA are not necessarily the same; similar requirements found in both statutes may have different levels of stringency, and some provisions that appear in one statute may not appear in the other. In addition, the proposed project is subject to federal and state environmental statutes and regulations that are separate from NEPA and CEQA but which require analyses that must be incorporated into the EIR/EIS. In circumstances where more than one regulation or statute might apply, this joint EIR/EIS has been prepared in compliance with the more stringent or inclusive set of requirements, whether federal or state.

The Authority and FRA have focused on avoiding and minimizing potential impacts through rigorous planning and thoughtful design, informed by the decisions they made at the conclusion of the first-tier EIR/EIS process, including the adopted mitigation strategies. The alternatives described in Chapter 2 and analyzed in Chapter 3 incorporate as part of their description means to avoid and minimize impacts through design, compliance with applicable laws and regulations, and compliance with established industry standards, as reflected in Appendix 2-D. The project-level environmental analysis conducted for this EIR/EIS and described in this chapter includes consideration of means to avoid, minimize, and mitigate potential adverse environmental impacts. In balance with other considerations, the Authority has defined alignments along existing transportation corridors and rights-of-way to the extent feasible, while accommodating the appropriate features and design standards for the Fresno to Bakersfield Section of the HST project, to minimize overall impact potential. When necessary, this chapter identifies site-specific mitigation measures for the HST project, including those specific to each alternative alignment, proposed stations, and the other facilities, such as the power conveyance and heavy maintenance facilities (HMFs).

As discussed in Chapter 2.0, Alternatives, after public circulation of the Draft EIR/EIS for the Fresno to Bakersfield Section, the Authority decided to reintroduce an alignment west of Hanford consistent with the preferred alternative identified in the Statewide Program EIR/EIS. The

Authority also decided to add another alternative through the Bakersfield area (the Bakersfield Hybrid Alternative). After evaluating the proposed addition of the Hanford West Bypass Alternatives, the Bakersfield Hybrid Alternative, and refinements being considered for existing Fresno to Bakersfield alternatives, the Authority and FRA determined that these changes made it necessary to prepare a revised Draft EIR and a supplement to the Draft EIS (Revised DEIR/Supplemental DEIS), which was circulated to the public in July 2012.

3.1.1 Chapter 3 Purpose and Content

This chapter consists of three sections—the Affected Environment, Environmental Consequences, Project Design Features, and Mitigation Measures—for each resource topic. The first section describes existing environmental conditions in the areas that would be affected by the proposed Fresno to Bakersfield Section of the HST Project and the No Project Alternative. This is followed by a discussion of potential environmental impacts associated with constructing and operating the HST alternatives. The sections in this chapter then conclude with a discussion of project design features that the Authority and FRA have identified to avoid or minimize potential adverse impacts and a discussion of site-specific mitigation measures where impacts cannot be otherwise avoided or reduced through design.

The analyses address the impacts of the alternative alignments, stations, and other related HST facilities as described in Chapter 2, Alternatives. They also incorporate impacts associated with related infrastructure changes required to accommodate the HST alternatives, such as roadway and interchange modifications, utility relocation, and addition of power substations, and identify key differences among the impacts associated with the alternatives. This document analyzes mitigation, impacts resulting from mitigation, and feasibility of mitigation.

Analysts used many sources to prepare this document. Chapter 10, References/Sources Used in Document Preparation, lists these sources.

3.1.2 Organization of This Chapter

Chapter 3 presents each environmental resource topic in its own section, as follows:

- Section 3.2 Transportation*
- Section 3.3 Air Quality and Global Climate Change*
- Section 3.4 Noise and Vibration*
- Section 3.5 Electromagnetic Fields and Electromagnetic Interference
- Section 3.6 Public Utilities and Energy
- Section 3.7 Biological Resources and Wetlands*
- Section 3.8 Hydrology and Water Resources*
- Section 3.9 Geology, Soils, and Seismicity*
- Section 3.10 Hazardous Materials and Waste*
- Section 3.11 Safety and Security
- Section 3.12 Socioeconomics, Communities, and Environmental Justice*

More About Schools

Analysis of schools in the project vicinity can be found in the following sections:

- 3.2, Transportation
- 3.3, Air Quality and Global Climate Change
- 3.4, Noise and Vibration
- 3.5, Electromagnetic Fields and Electromagnetic Interference
- 3.10, Hazardous Materials and Waste
- 3.11, Safety and Security
- 3.12, Socioeconomics, Communities, and Environmental Justice
- 3.13, Station Planning, Land Use, and Development
- 3.15, Parks, Recreation, and Open Space
- Effects on School District Funding and Transportation Bus Routes (Technical Appendix 3.12-B) and Children's Health and Safety Risk Assessment (Technical Appendix 3.12-C)

- Section 3.13 Station Planning, Land Use, and Development
- Section 3.14 Agricultural Lands
- Section 3.15 Parks, Recreation, and Open Space
- Section 3.16 Aesthetics and Visual Resources*
- Section 3.17 Cultural and Paleontological Resources*
- Section 3.18 Regional Growth
- Section 3.19 Cumulative Impacts

The asterisks in this list indicate sections supported by a technical report containing additional detailed analyses. In addition, other technical appendices to several resource topics provide key information used in preparing the affected environment discussions. See the Table of Contents for a list of all technical appendices.

3.1.3 Approach to the Analysis

This section provides a summary of the type of information contained in the subsections for each resource and generally describes the approach to the impact analysis.

In all sections, information flows in the following geographic and project order: north to south for alignment alternatives and their corresponding station alternatives followed by the HMF study alternatives. The alternative alignments considered for the Fresno to Bakersfield Section include eight alternative alignments in the more rural area between Fresno and Bakersfield and three alternative alignments in Bakersfield. Any combination of these alternatives could comprise the complete alignment from Fresno to Bakersfield, creating a total of 108 distinct alternative alignment combinations. Instead of discussing 108 alternatives, all sections begin with a single alignment from Fresno to Bakersfield (the BNSF Alternative); then the additional alternatives that would deviate from this alignment are presented, beginning in the north and proceeding to the south in the following order: Hanford West Bypass 1, Hanford West Bypass 1 Modified, Hanford West Bypass 2, Hanford West Bypass 2 Modified, Corcoran Elevated, Corcoran Bypass, Allensworth Bypass, Wasco-Shafter Bypass, Bakersfield South, and Bakersfield Hybrid.

The project vicinities used for description and illustration of affected environment and impacts center around the cities of Fresno, Hanford, Corcoran, Wasco, Shafter, and Bakersfield. Analysts use smaller geographic areas, such as around the HST stations or the crossing of the Kings River complex, to demonstrate the design options within the Fresno to Bakersfield corridor at a more detailed scale. Each resource topic addressed in Chapter 3 includes the following sections:

Introduction. The introduction presents the reader with an overview to the topic and the critical issues and concerns considered in the analysis.

Laws, Regulations, and Orders. The laws, regulations, and orders discussion for each resource topic identifies the relevant regulatory framework, and includes statutes of CEQA and NEPA, as well as other regulatory agency guidelines relevant to project approvals or decisions for that resource topic.

Methods of Evaluation of Impacts. This section describes the methods used to collect data and evaluate potential impacts. This includes the following:

- **Methods for Evaluating Impacts under NEPA.** The requirements specify that project effects be evaluated based on the criteria of context and intensity. This section describes criteria that qualify impacts as having negligible, moderate, or substantial intensity under NEPA.
- **CEQA Significance Criteria.** For each resource topic, analysts use significance criteria to identify when impacts are considered adverse and warrant mitigation measures to help

reduce the magnitude and severity of these impacts. These criteria are largely based on CEQA guidelines, which generally describe when impacts would be considered *significant* or when there would be a *substantial*, or *potentially substantial*, adverse change in any of the physical conditions within the area affected by the project. Where possible, significance criteria use state or federal standards. For example, air quality significance criteria follow the state and federal ambient air quality standards; noise significance criteria use thresholds defined by the FRA. In other cases, for example the visual resources analysis, the significance criteria rely on guidelines and policies, assessment methodologies such as those used by the FRA and professional standards.

- **Study Area for Analysis.** The study area includes the area surrounding all project components and a buffer specific to each resource area. The project components include the proposed HST right-of-way and associated facilities such as traction-power substations and switching and paralleling stations, as well as the shifts in roadway rights-of-way associated with those facilities—including overcrossings and interchanges—that would be modified or shifted to accommodate the HST project, as described in Chapter 2, Alternatives. The area of permanent effect would include the following:

<ul style="list-style-type: none">- HST Right-of-Way – would vary between 120 feet for rural areas and as little as 50 feet in constrained areas.- Traction-Power Substations – would each require a 30,000-square-foot (or 200-foot by 150-foot) site adjacent to the HST alignment.- Switching and Paralleling Stations – switching stations each would need a site of approximately 9,600 square feet (generally 120 by 80 feet) and paralleling stations each would need a site of approximately 8,000 square feet (generally 100 by 80 feet) adjacent to the proposed HST.- HST Stations – the stations and associated structures including parking are analyzed as city blocks.- Heavy Maintenance Facility Alternatives – depending on the site, each HMF may be up to 154 acres and generally 10,560 feet long by 3,000 feet wide at the widest portion. Two access tracks would diverge from the through tracks (four tracks total) on either side of the HMF, requiring a 160-foot HST right-of-way along the access tracks.- Project roadway modifications – would have varying right-of-way and distance from the HST right-of-way, as illustrated on Figure 3.1-1, and would include the following:<ul style="list-style-type: none">▪ New two-lane overcrossings over the HST right-of-way.▪ Shift two-lane frontage roads (two to four lanes, with shoulders) that parallel the HST right-of-way.	 <p>What Is the Project Study Area?</p> <p>The Fresno to Bakersfield Section study area extends south from Fresno and north from Bakersfield. It extends east from the BNSF corridor and west from the UPRR corridor. The Fresno to Bakersfield Section crosses central Fresno County, northeastern Kings County, southwestern Tulare County, and northern Kern County.</p>
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The HST project would require acquisition of property necessary for project operation. When the remnant portion of an acquired parcel beyond the right-of-way is too small to sustain current use without other modifications, it would also be acquired. These remnant parcels would not be used for construction and would be sold after project construction. The HMF sites and other identified sites along the alignment would be considered for construction staging.

Affected Environment. The affected environment discussion summarizes the information providing the basis for analysis of potential impacts on each environmental resource. Information in the affected environment discussion is presented for the entire Fresno to Bakersfield Section, including a discussion of the regional context. The affected environment discussions describe the existing conditions available in the most recent publicly available data or collected during field work in 2009, 2010, and 2011.

Where appropriate and not overly speculative, the anticipated 2035 conditions that would pertain without the project are used as the No Project condition. Resource areas that discuss 2035 conditions include, for example, transportation and air quality, for which projected future conditions were adopted by regional and local planning agencies.

Environmental Consequences. The environmental consequences discussion describes the potential environmental impacts of the No Project Alternative and the HST alternatives. The Environmental Consequences section evaluates direct and indirect impacts¹ for the No Project and HST alternatives for the following periods:

- *Construction Period Impacts* – Temporary (short-term and long-term) impacts associated with the construction of the HST alternative. The construction period includes testing of the HST System prior to passenger service.

The Authority will not acquire temporary construction staging areas through the Right of Way acquisition process. It will be the responsibility of the Design-Build Contractor to negotiate with property owners to secure access and temporary use of their property for staging or lay-down areas. To provide the Design-Builder with sufficient potential staging areas, this EIR/EIS includes an evaluation of the environmental impacts of various vacant parcels that are located adjacent to or near parts of the project that would require construction staging and lay-down areas such as bridges, elevated structures, etc. Including the impacts from potential construction staging areas results in a conservative analysis because the limits of impacts for each site is identified by parcel boundaries not the actual amount of acres that maybe necessary for staging or storage of materials.

- *Project Impacts* – Permanent impacts related to the project operation and maintenance of the HST alternative. Project operations include HST System operations and related project improvements, such as roadway modifications, maintenance of power supply components, and maintenance of the HST, including the HMF site operations. Some permanent impacts initially occur during construction, but because they are permanent, they are associated with the project impacts (for example, conversion of agricultural lands to transportation uses).

¹ Indirect effects are generally defined as those that are caused by a project, but unlike direct effects, occur later in time or are farther removed in distance but are still reasonably foreseeable.

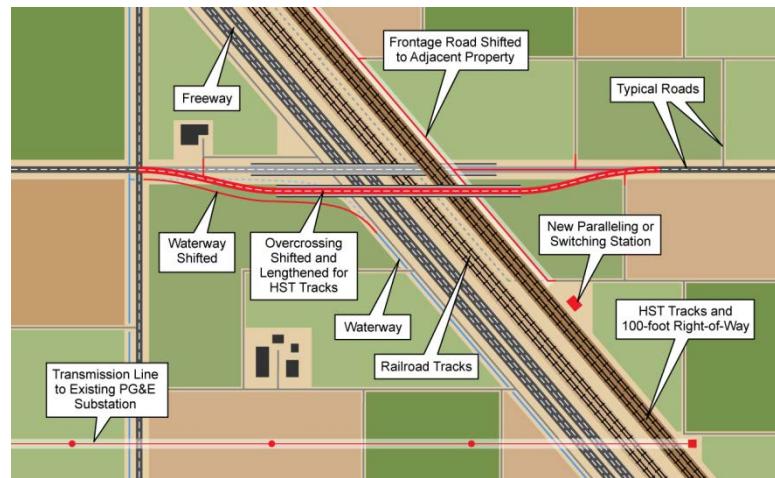


Figure 3.1-1
Shifts of Roadways and Other Infrastructure

The Environmental Consequences section includes discussion of construction period and project impacts. The analyses assessed whether these impacts would have no effect, an adverse effect, or a beneficial effect on environmental resources. These terms have the following meanings:

- *No Effect* – The HST alternative would not alter the environmental status quo.
- *Adverse Effect* – The HST alternative would negatively affect the environmental resource value or quality as it exists prior to the project. These effects are qualified as negligible, moderate, or substantial intensity under NEPA and less than significant or significant under CEQA.
- *Beneficial Effect* – The HST alternative would result in improvement of the environmental resource value or quality as it exists prior to the project.

Project Design Features. The design of the project incorporates design features, standard engineering practices, and compliance with federal and state regulations such as best management practices (BMPs) that will reduce or minimize the project's impacts. This section lists such features.

Mitigation Measures. NEPA requires identification of potentially adverse effects and the suggestion of appropriate mitigation measures. This is accomplished through both the project design features and the mitigation measures. CEQA requires that each significant impact of a project be identified and feasible mitigation measures be stated and implemented. Mitigation measures are identified for adverse construction period or project impacts that cannot be avoided or minimized adequately through project design. The mitigation measures section identifies possible measures to avoid, minimize, rectify, reduce, eliminate, or compensate for significant adverse effects. The section also summarizes potential impacts associated with implementing mitigation measures. If there are no mitigation measures required, this section is not included. The mitigation measures are based on the mitigation strategies presented in the Final Statewide Program EIR/EIS (2005) and the Bay Area to Central Valley Program EIR/EIS (2008) and Partially Revised Final Program EIR (2012), as they may apply to the Fresno to Bakersfield Section. The programmatic mitigation strategies in the Program EIR/EISs provided a foundation for crafting mitigation measures and additional mitigation measures were identified where appropriate. The mitigation measures that will be applied to the HST Project are abbreviated "MM" and numbered in the order identified in the section. For example, the first mitigation measure for air quality impacts is AQ-MM#1, and for aesthetics and visual resources it is AVR-MM#1. Also see Section 3.1.4 below.

NEPA Impacts Summary. This section summarizes the environmental consequences specific to NEPA requirements and states whether the impact is beneficial or adverse, and if adverse, whether it is an impact with negligible, moderate, or substantial intensity. The section also provides a summary of the relative context of the impact. Based on the intensity and context, this section provides a conclusion about whether the impacts considered are significant or not under NEPA. Residual adverse impacts after mitigation are described.

CEQA Significance Conclusions. This section lists the significant impacts identified in the Environmental Consequences section for each resource, identifies the level of significance prior to mitigation, and indicates which mitigation measures are available to reduce the level of each impact. If the measure's implementation would reduce the potential impact below the significance threshold, the impact would be considered less than significant after mitigation. If, however, the impact would remain above the significance threshold with the mitigation measure, the impact would be considered to be significant and unavoidable. This section identifies the level of significance after mitigation.

Cumulative Impacts. To understand fully a proposed project's environmental implications, CEQA and NEPA require that its effects be examined in conjunction with other past, present, and reasonably foreseeable projects. Section 3.19 discusses cumulative impacts for each resource and determines whether the proposed project's incremental contribution to the significant cumulative impacts identified for each resource area is cumulatively considerable under CEQA, and whether its contribution would be significant under NEPA.

3.1.4 Legal Authority to Implement Offsite Mitigation

The rest of Chapter 3.0 analyzes the HST Project's potential physical environmental effects on various resource areas. If a potential significant effect is found, mitigation measures are proposed. Most mitigation measures identified are within the Authority's jurisdiction and control. These include physical measures to be done within the HST Project right-of-way (for example, sound barriers adjacent to the track), physical modifications to the project design itself, and construction methods and techniques (the Authority will be able to require these of its design-build contractors), among others. Similarly, mitigation that involves the Authority's contributing its fair share of the cost of future services is largely within the Authority's control.

Some of the proposed mitigation measures would occur on property the Authority would not own as part of its right-of-way acquisitions. These are sometimes referred to as "offsite" mitigation.

For example, the transportation analysis (Section 3.2) identifies various traffic improvement mitigation measures to occur along the HST alignment. These measures include, for example, installing new traffic signals, modifying lane widths, and adding lanes and turn pockets. In most cases, the roadways and intersections on which mitigation is proposed are owned and controlled by local governments. The Authority intends to work cooperatively with local governments along the HST alignment to confirm that the Authority can implement all traffic mitigation measures/improvements. The Authority has continued to work with local governments to confirm that traffic mitigation meets the identified performance standards in Section 3.2, Transportation, and can be accomplished.

The Authority and FRA have not identified any offsite mitigation measures that they believe are infeasible or unlikely to occur. The offsite mitigation measures recommended in this EIR/EIS are physically feasible. The Authority will continue its current practice of developing memoranda of understanding and funding agreements with local governments to facilitate agreement on implementation of offsite mitigation measures on property owned at the local agency level.

3.1.5 Summary of Changes Between Revised Draft EIR/Supplemental Draft EIS and Final EIR/EIS

The analysis in this chapter includes revisions based on design refinements and analytical refinements. Design refinements are described in detail in the Executive Summary and are summarized as follows:

- Designs for road overcrossings and undercrossings for all alternatives revised to be consistent with local government requirements.
- Design for BNSF Alternative Kings River complex crossing revised to accommodate levee Maintenance access for Kings River Conservation District.
- Design modification north of Corcoran to avoid Caltrans right of way along SR 43.
- Design revised to accommodate minor adjustments in the location of traction power facilities.
- Design revised to include potential for sewer line extension along East Lacey Boulevard to serve the Kings/Tulare Regional Station East Alternative.
- Design revised to reduce impacts on businesses.
- Design revised to reduce environmental impacts.

- Design revised to add minor project features and geometric refinements.
- Design revised for Hanford West Bypass alternatives to avoid 4(f) properties.
- Design revised for straddle bents.
- Refinements to allow for seismic upgrades of Caltrans overcrossings.

Analytical refinements are summarized as follows:

- Revisions in the text in response to comments on the Revised Draft EIR/Supplemental Draft EIS to clarify and amplify the analysis and discussion. For example, the EPA provided a comment to provide additional analysis of local air quality impacts to sensitive receptors. This analysis was completed and added to the Final EIR/EIS
- Correction to a technical error in the traffic modeling for projected station area traffic intersection impacts.
- Revisions to the analysis of greenhouse gas project impacts and benefits based on refined and updated modeling tools and updated assumptions.
- Revisions to reflect information gathered and analyses conducted in consultation with federal agencies for compliance with Section 106 of the National Historic Preservation Act, Section 404 of the Clean Water Act, and Section 176(c) of the Clean Air Act.
- Revisions to acreage tables that reflect the above changes to the project design, and corollary changes to the environmental analysis, where necessary.
- Revisions to mitigation measures for biological resources and wetlands impacts to incorporate recommendations of federal and state regulatory agencies.
- Revisions to add information about the range of potential off-site mitigation areas for biological resources.
- Inclusion of material as identified by NEPA and CEQA for a Final EIR/EIS, including copies of written comment letters and verbal comments received during the public circulation period for the Revised Draft EIR/Supplemental Draft EIS, and responses to those comments.
- Revisions to cost data in Chapter 5 based on the updated 15% design quantities analysis and the draft 2014 Business Plan.

The shaded areas in the Final EIR/EIS are intended to provide the reader with a simplified way to identify much of the revised language changes and refinements that differ from the text in the Revised Draft EIR/Supplemental Draft EIS. However, it is not a word-for-word representation and not all changes are shaded. The shading is a guide to help the reader to navigate the revisions. Because the alternatives have been refined since circulation of the Revised Draft EIR/Supplemental Draft EIS, the tables in many of the chapters are gray to indicate analytical changes that result from design refinements